Space Weather Forecast

Issued on Friday, 18 August 2023 at 12:18 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Chance of isolated Moderate flares (R1 Blackouts) throughout.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity has been Low, with occasional Common-class flares. Peak flare of C5.1 at 17/1240 UTC from AR3397, which has since rotated across the western limb. There are currently eight regions on the visible disc. The largest group, situated on the northwest of the disc, is also one of the more complex but has remained relatively stable. A nearby region continues to grow meridionally, with a number of spots developing in recent hours. One other region of significance, is a moderately sized region in the northeast. This has remained relatively unchanged and appears simple, however a filament across the region adds a layer of complexity and uncertainty.

No Earth-directed Coronal Mass Ejections (CMEs) were detected in available imagery, with observed ejecta from western limb events.

Solar Wind / Geomagnetic Activity: A weak enhancement was observed as Earth moved into the region ahead of stream of fast winds from a coronal hole. These fast winds then arrived at L1 around 18/0200 UTC. Solar wind speeds were initially at slow-ambient levels, around 320 km/s, before increasing sharply around 18/0200 UTC to 420km/s and have since fluctuated between 420-500km/s. The total interplanetary magnetic field strength (IMF), was generally weak, but increasingly erratic and strengthening after 17/1600 UTC, reaching moderate levels, and peaking at 18/0209 UTC. The important north-south component was initially weakly negative, but became predominately moderately positive from 17/1630 UTC. Since 17/2350 UTC, the north-south component has fluctuated markedly with no prolonged period either positive or negative. Geomagnetic activity was Quiet to Unsettled (Kp1-3).

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) remained at background levels.

Four-Day Space Weather Forecast Summary

Solar Activity: Low activity is likely, but with a chance of isolated Moderate flares. There is the potential for one or more notable active regions to rotate onto the disc Day 2 (19 Aug) or Day 3 (20 Aug).

Solar Wind / Geomagnetic Activity: No Earth-directed Coronal Mass Ejections (CMEs) are currently expected. The ongoing enhancement to solar winds (450-500 km/s) associated with the influence of a stream of fast winds from a coronal hole are expected to wane later Day 1 (18 Aug) or Day 2. Winds are then expected to gradually return to slow-ambient levels. Quiet (Kp0-2) to Unsettled (Kp3) geomagnetic activity at first, with a slight chance of Active intervals. This risk passes later Day 1, with mainly Quiet activity and a decreasing chance of Unsettled intervals through the remainder of the period.

Energetic Particles / Solar Radiation: The count rate of energetic particles is forecast to persist at background levels with no solar radiation storms occurring.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	1	1	1	1
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	30	30	40	40
Very Active	R3 to R5 X	No	1	1	1	1

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	2	2	2	2
Very Active	≥ S3 *	No	1	1	1	1
* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)						

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